

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

# PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/CH2004/000494

International filing date (day/month/year)  
06.08.2004

Priority date (day/month/year)  
08.08.2003

International Patent Classification (IPC) or both national classification and IPC  
B01F7/28, B01F7/00, B01F15/06, B01J19/18, B01J10/02

Applicant  
ETHZ

## 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

## 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**International application No.  
PCT/CH2004/000494

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
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**Box No. II Priority**

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1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

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**Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	9,10
	No: Claims	1-8,11-19
Inventive step (IS)	Yes: Claims	-
	No: Claims	1-19
Industrial applicability (IA)	Yes: Claims	1-19
	No: Claims	-

2. Citations and explanations

**see separate sheet**

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)

International application No.

PCT/CH2004/000494

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:

- D1: GB-A-2 103 229 (A & P CHEM SAFETY SERV) 16 February 1983 (1983-02-16)
- D2: US-A-4 175 871 (SUH NAM P ET AL) 27 November 1979 (1979-11-27)
- D3: US-A-3 407 046 (MASSOUBRE JEAN-MARIE) 22 October 1968 (1968-10-22)
- D4: US-A-4 911 847 (BADIALI MARIO ET AL) 27 March 1990 (1990-03-27)

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of **claim 1** is not new in the sense of Article 33(2) PCT.

The document D1 discloses (cf. figures 1 and 2) a *reactor and/or mixing vessel comprising at least*

- *an outer in a direction extending vessel-like member (1) and*
- *an inner in the direction extending member (3) arranged within the outer member, at least one of which is adapted for rotation with respect to the other member, the direction being the rotation axis, and at least one of which has a cross-section at least nearly perpendicular to the rotation axis of non-circular shape in such a way that the gap (9) between the inner and the outer members is of non-constant width therebetween in circumferential direction,*
- *at least one inlet (10) for introduction of fluid and at least one outlet (13) for discharging fluid in and out of the reactor and/or mixing vessel.*

2.2 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of **claim 13** is not new in the sense of Article 33(2) PCT.

The document D1 discloses (cf. figures 1 and 2) a *process for reacting and/or mixing of at least one fluid component within a reactor whereby the fluid is mixed or reacted within a gap between an outer and an inner member, at least one of which is of a cross-section of non-circular shape so that the gap width at a fixed position varies with the rotation of at least one of the two members.*

- 2.3 The subject-matter of **claims 17-19** cannot be considered new with regard to the disclosure of D1 (Article 33(2) PCT).
4. Dependent **claims 2-12 and 14-16** do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, the reasons being as follows:
- 4.1 The additional features of **claims 2-4, 6, 7, 11, 12 and 14-16** are already disclosed in document D1, cf. figures 1 and 2.
- 4.2 The additional features of **claim 5**, in combination with the features of claim 1, are already disclosed in document D2, cf. figure 5.
- 4.3 The additional features of **claim 8**, in combination with the features of claim 1, are already disclosed in document D3, cf. figure 3.
- 4.4 The additional features of **claims 9 and 10** are already disclosed in document D4, cf. abstract.

**Re Item VII**

**Certain defects in the international application**

1. To meet the requirements of Rule 27(1)(b) EPC, the documents D1, D2 and D3 should be identified in the description and the relevant background art disclosed therein should be briefly discussed.
2. The features of the claims should be provided with reference signs placed in parentheses to increase the intelligibility of the claims (Rule 29(7) EPC). This applies to both the preamble and characterising portion (see the Guidelines, C-III, 4.11).

**Re Item VIII**

**Certain observations on the international application**

1. Regarding **claims 4, 6 and 11**, it must be considered that expressions as "preferably", "for example", "such as" or "more particularly" have no limiting effect on the scope of the claim. Thus, the features following such expression are to be regarded as entirely optional (see PCT Guidelines, Part II, 5.40).
2. **Claim 14** does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The claim attempts to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result.